THE ZOOLOGIST

No. 708.—June, 1900.

ON SEXUAL DIFFERENCES IN THE FEATHERING OF THE WING.

By Ed. Degen.

Under this heading Dr. A. G. Butler has published (Zool. 1898, pp. 104, 105) his observations made on the Sky-Lark (*Alauda arvensis*), and more recently again (*ante*, pp. 74, 75) the results of his investigations in regard to the House-Sparrow (*Passer domesticus*). Unquestionably any additional knowledge of birds whose plumage, on account of the great similarity existing between the two sexes, offer such great difficulties in distinguishing between them, as the Sky-Lark and many others, will be not only appreciated by the aviculturist, but also by the ornithologist and student, the fuller such information is afforded. That differences in the area of the bird's wings of the two sexes exist, at any rate for the species referred to above, has been shown by Dr. Butler in the respective dimensions of their wings. More important, however, are the deductions he makes therefrom, other than mere sexual differentiation; especially when he calls attention to a possible advantage in power of flight acquired by the male bird over the female, induced by a slight increase in the wing-feather area—in those cases, at least, as he points out, where a reduction in the weight of the body, as in the male Dunlin, does not take place.

As I happen to possess a series of over thirty specimens of the Black-backed Crow-Shrike, or Piping Crow (*Gymnorhina tibicen*), erroneously, but very persistently, called Magpie by the colonists, collected during my stay in Australia, I decided, after reading with interest Dr. Butler's remarks on the subject, to seize the opportunity for trying to ascertain from such ample material the extent to which this principle might affect this particular species.

Dr. Butler's method for measuring the dried and mounted wing consists in ascertaining its length from the upper head of the upper arm-bone to the extreme tip of the longest of the flight-feathers, which is situated on the hand portion. Since any difference in the measurements can therefore only be the result of this *longest* of the primaries itself, I came to the inevitable conclusion that in this way no information at all is procurable in regard to the extent to which the rest of the remiges participate on the area of wing for supposed sexual difference, an adjunct of no mean importance in this question. To supply this deficiency necessitated the measuring of *all* the flight-feathers separately, on one side at least, which in the present case was that of the left-hand wing. This process was rendered somewhat easier from the fact that only three of the specimens examined were dry skins, all the others being preserved in spirit. There are ten primaries and also ten secondaries in the wing of this species. By commencing to count the primaries from the tip of the wing inwards, as Dr. Butler has done, the fourth flight-feather is found to be the longest of all. This makes this remex identical with the corresponding one of the song-birds proper, or Oscines, in which group it has been considered to be the third, owing to the "assumed" absence of the first or outermost remex. For this reason I have here followed the practice now generally adopted by systematists of counting the primaries from within—that is, the carpal joint, outwards to the extreme end. By doing this it will be found that the longest primary in this species is the seventh in number, same as in the case of the song-birds, where there is supposed to be one less, namely, the tenth.

All my measurements are expressed in millimetres. The highest figures for the seventh, or the longest primary, obtained for the twenty-seven specimens examined, are the following:—

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For an adult male	219 mm.
For a juvenile male	212 "
For an adult female	205 "
For a juvenile female	205 "

The lowest figures obtained for the same quill-feather were:—

For an adult male	200 mm.
For a juvenile male	200 "
For an adult female	190 "
For a juvenile female	192 "

It will be noticed from the foregoing figures that, as far as difference of sex is concerned, there is a marked excess of length for this longest of the flight-feathers in both the old and the young individual male birds over the females of from 7 to 14 mm. We thus find Dr. Butler's conclusions fully confirmed when confining ourselves to *this feather exclusively*, but if the same test be applied to a considerable number of individuals we not only get every degree of length possible for this quill amongst the two sexes, but as a matter of fact the same individual variation manifests itself in all the other flight-feathers. For this longest one, then, we get a range from a maximum of 219 mm. to a minimum of 200 mm. for adult males; the latter being smaller by 5 mm. to female individuals, both old and young, which is that of 205 mm.

If the relative lengths range for the adult males between 219 to 200, for the young males from 212 to 200, they do the same in the case of the females, which for the adults is one of from 205 to 190, and one of 205 to 192 in young females.

A reproduction of the table of measurements of all the twenty flight-feathers in the wings of these twenty-seven birds would serve no useful purpose, as may be gleaned from the following example, applying to the first specimen composing the list of birds measured:—

Primaries.

	X	IX	VIII	VII	VI	V	IV	III	II	I
mm.	105	176	209	212	210	195	169	159	150	145

Secondaries.

I	II	III	IV	V	VI	VII	VIII	IX	X
140	138	132	128	121	118	112	105	95	70

Sum total, 2889. Formula for index, $\frac{2889}{20 \text{ (remiges)}} = \text{index}$, 144·4.

Not only does this index afford a means for a comparison of the specimens, but it should have the advantage also of giving a more accurate estimate of the real flight-feather area.

Table I. has been compiled from the indices thus obtained by placing them side by side, according to the respective sex and approximate age of the specimens, and in serial order of diminishing figures of these indices.

On the whole, the result of this investigation for eliciting additional evidence in proof of the establishment of a clearly defined line between males and females from the point of difference in the length of the flight-feathers cannot be said to have been a very satisfactory one—at any rate, not for this particular species. The same may very reasonably be inferred from the genus as a whole, to which this species belongs.

On the other hand, and which Table I. shows also, it has been productive of supplying an approximate estimation of the rates of percentages at which the two sexes participate in the maxima and the minima of excess or reduction respectively. Thus 18·5 per cent., or five males only, *absolutely exceed* in greatest length of flight-feathers; the 59·3 per cent.=nineteen individuals, indiscriminately represent males and females, as well as every range of length; these are Nos. 6 to 21 of Table I., or considerably over the half of this large series of birds. Of females, six only are *absolutely inferior* in length, forming 22·2 per cent. of the whole. By dealing, however, separately with the sexes, the five males just referred to, out of a total of sixteen, with absolutely higher indices, form 31·2 per cent. Similarly, of the eleven individuals constituting the female portion, six of them show indices absolutely inferior to the remaining seven, or 54·5 per cent., a little over the half for females.*

The measurements obtained for the seventh or longest primary, when compared with the indices derived from the aggregates of all the flight-feathers in the wing, *do not coincide always* exactly with the rank which has been allotted to the specimen on the list, the latter being the outcome of the index received. As an instance, the first specimen on the list (Table I.), whose index is 144·4, has its longest remex shorter by 2 mm. than the corresponding one of No. 4, whose index of 141·4 is so much lower. The adult male No. 2, with its inferior index of 143·4, exceeds the young male No. 1 by 7 mm. in the longest primary, which measures 219 mm., and is the longest of all. These examples should suffice for showing the great individual variations obtaining throughout alike. Not more than five males exceeding the others by highest indices, also exceed them by having the longest measures for the seventh primary.

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* These birds are a non-migratory species, and the greater proportion of males to females in a collection made in the same locality as this one was, may be taken as a fair estimate for the proportion of the sexes in a free state. This probably accounts also for the great number of them existing still, although they were considerably disturbed by the influx of the white population settling everywhere in the country.

It is obvious, then, that as a means of diagnosis for the determination of sexes, a really characteristic difference in the lengths of the wing, or wing-feathers, found to exist in the species dealt with by Dr. Butler, has almost broken down in this particular case.

In addition to the indices on Table I., I have appended a further column, in which the length and the girth of the beaks are given. A comparison of these dimensions in their present order of indices—with which they in no way agree, any more than amongst themselves—does not exactly afford a ready means for discriminating between them. To achieve this latter purpose better, I have dealt with this character separately on Table II. by numbering the specimens according to the diminishing lengths of their beaks, but otherwise adhering to the plan adopted in Table I.

The arrangement of Table II. therefore shows that, apart from the differences in the colour of the plumage on the backs between adult males and females of this species, which does not enter into the scope of this work, a very good character for sexual difference, and of *greater reliability than we have seen to exist for dimensions of wings, lies in the length of the beak.*

With one exception only, namely, that of an adult male (No. 25 of Table II.), which is conspicuous by having an abnormally short beak (like the two young females at the bottom of the list), *all females have their beaks inferior in length to the males;* but nevertheless there is, as might be expected, great individual variation perceptible also in both sexes, Very little positive value should be attached to the girth measurements taken at the base of the beaks, as may be inferred by a consultation of the columns devoted to these on Table II., which may be noticed particularly in the case of the three dry skin specimens distinguished from the others by an asterisk, and mentioned before. They prove in a striking manner that considerable shrinkage takes place on drying out, which, if ignored when admitting this measurement for a comparison of fresh with cabinet specimens, may lead to erroneous deductions.

TABLE I.

INDICES OF FLIGHT-FEATHERS.

	No.*	MALES.		FEMALES.		†	BEAKS.	
		Old.	Young.	Old.	Young.		Length	Girth
							mm.	mm.
18·5 per cent.	1		144·4			10	50	71
	2	143·4				14	50	70
	3	142·8				6	53	70
	4	141·4				7	52	71
	5	140·9				3	55	70
59·3 per cent.	6				139·7	19	48	66
	7	139·5				8	52	70
	8		139·4			2	57	70
	9				138·6	17	48	73
	10	138·5				9	50	73
	11	138·0				11	50	70
	12				137·9	20	48	—
	13			137·1		23	47	69
	14				137·0	16	49	68
	15	136·05				4	54	72
	16		136·0			5	54	69
	17		135·9			15	50	68
	18		135·8			12	50	70
	19	135·5				25	46	67
	20		135·1			1	57	75
	21		132·7			13	50	70
22·2 per cent.	22				131·3	27	44	64
	23			130·2		24	46	75
	24				129·8	21	48	62‡
	25				129·8	18	48	68
	26			129·3		22	48	62‡
	27				124·9	26	45	62‡

* Serial numbers of specimens in diminutive order of their indices.

† Numbers referring to serial arrangement of Table II. (first column).

‡ Dried skins.

TABLE II.

DIMENSIONS OF BEAKS.

No.*	MALES.		FEMALES.		†
	Old.	Young.	Old.	Young.	
1	....	57—75	....	....	20
2	....	57—70	....	....	8
3	55—70	....	....	....	5
4	54—72	....	....	....	15
5	....	54—69	....	....	16
6	53—70	....	....	....	3
7	52—71	....	....	....	4
8	52—70	....	....	....	7
9	50—73	....	....	....	10
10	....	50—71	....	....	1
11	50—70	....	....	....	11
12	....	50—70	....	....	18
13	....	50—70	....	....	21
14	50—70	....	....	....	2
15	....	50—68	....	....	17
16	....	....	....	49—68	14
17	....	....	....	48—73	9
18	....	....	....	48—68	25
19	....	....	....	48—66	6
20	....	....	....	48	12
21	....	....	....	48—62‡	24
22	....	....	48—62‡	....	26
23	....	....	47—69	....	13
24	....	....	46—75	....	23
25	46—67	....	....	....	19
26	....	....	....	45—62‡	27
27	....	....	....	44—64	22

* Serial numbers, with diminutive length of beaks.

† Numbers referring to serial arrangement of Table I. (first column).

‡ Dried skins.

LAND BIRDS AT SEA.

By Lieut. Robert E. Vaughan, R.N.

The published notes in the 'Zoologist' under the above heading by Surgeon K. Hurlestone Jones, R.N. (*ante*, p. 51), and Mr. Malcolm Burr (*ante*, p. 144) greatly interested me, and have caused me to read up my own note-book and write a few words on the subject, more especially as I can add some fresh species to the list.

Dr. Hurlestone Jones mentions having recognized eleven species, while Mr. Burr makes mention of six. My list of land birds contains fourteen species, of which six have appeared in the two previous lists, and bring the total number under observation up to twenty-three.

My observations are of a recent date, extending from Sept. 10th to Oct. 16th, 1899, whilst travelling between Aden and Plymouth, and during the season of autumnal migration.

I happened to be returning to England from Australia in H.M.S. 'Royalist,' a small vessel, barque-rigged, and consequently supplied with numerous spars and ropes, which would form ample and convenient resting-places for any chance avian visitors, or passengers, as I may call some of them, seeing that a few remained on board for about a couple of days.

We left Sydney, Australia, on July 7th, and on the 8th, at sunset, a Noddy Tern (*Anous stolidus*) settled on one of the boats' davits and went to sleep, where I succeeded in capturing it. This is somewhat of a digression, but is worth recording. The Noddy is essentially a pelagic bird, which, being the case, I think makes its occurrence on board all the more noticeable, as it could have slept on the water in comfort, as the weather was fine. In fact, this is the first time during some years afloat that I have seen any sea bird settle on a vessel at sea, though when at anchor it is not unusual for some of the *Laridæ* to settle for a while.

No other bird visited us till after we had left Aden, on Sept. 10th, and were entering the Red Sea on the 12th, when a Hoopoe (*Upupa epops*) arrived during the night, and was discovered at sunrise. The efforts of a sailor in trying to catch it frightened the bird away, and it failed to return.

Next day, Sept. 13th, a Golden Oriole (*Oriolus galbula*, female) arrived and settled on top of the awning. This time the sailor did catch it by the tail, which was all the bird left behind in the hands of the astonished tar, and *O. galbula* flew away southwards, steering a most ungainly and awkward course. No sooner had she gone than a Collared Turtle-Dove (*Turtur risorius*) arrived and settled on the jibboom, where it stayed till the afternoon, when it also flew off towards some land which was in sight.

The next afternoon, while I was on watch, a Greenfinch (*Ligurinus chloris*), flying across the Red Sea from east to west, flew in at one of our gunports, across the deck, and out through the opposite port, and was soon lost sight of. I consider this a most odd and unnecessary proceeding, and the bird acted as if it was being pursued by a Hawk, although no such bird was in sight.

Daybreak next morning revealed two Turtle-Doves (*Turtur communis*), which had, I suppose, been attracted during the night by our lights, and about 9 a.m. they were joined by three more, the whole party remaining with us for the day and sleeping at night, two in the maintop and three on the topsail yard. Next morning, Saturday, the 16th, three of our friends the Turtle-Doves had disappeared, and the remaining two stayed with us all that day, and did not leave till the following forenoon, when the weather, which had been a flat calm, changed, and a fresh breeze sprung up.

Although these two Turtle-Doves (presuming they were the same, an assumption that seems allowable) had been with us over fifty-six hours, they had nothing in the way of food. It causes one to wonder what are a bird's fasting capacities, especially on migration. I tried to tempt them with peas, &c., spread out on the awning, but they refused to come down from aloft.

This afternoon I noticed, through a telescope, a flock of between forty and fifty birds, which I believed to be Greenfinches (*L. chloris*); but they were rather brightly coloured, and may have been the African variety of this bird (or the *Ligurinus aurantiiventris* of the followers of Dr. Cabanis). They were flying in the same direction as the Finch previously mentioned, very low, only about two feet above the water. This was the only flock of any species I saw during the five weeks I was observing land birds.

Later in the afternoon a Quail (*Coturnix communis*) flew on board and settled on the nettings (or bulwarks, as they are called by landsmen). A marine tried to catch it, but it rose, and flying round the ship settled again in the same place. Then another attempt was made, with the same result; and seven times did this bird settle on its originally selected spot, only to be stalked by various members of the crew, who tried to catch it with their caps, &c. After trying an eighth time to settle, it changed its mind and eventually flew away. I don't know why the bird should have persistently chosen to settle on the same spot each time and meet with the same welcome, considering the ship was over two hundred feet long and there were many more comfortable and secluded spots where it would have been out of sight of everyone.

On getting into the Gulf of Suez next day at about 4 p.m., we were visited by three representatives of the family *Hirundinidæ*, and Her Majesty's Government that night provided well-aired lodgings, free, for three Swallows (*Hirundo rustica*), one House-Martin (*Chelidon urbica*), and three Sand-Martins (*Cotile riparia*). One of the latter and one of the former were caught and brought to me. The Swallow, when released, began to twitter; and I may say of all the birds I saw during our passage home this was the only one that uttered a note of any sort. The silence of our bird visitors (although they were not representatives of our most garrulous British species) was most apparent, and I cannot understand why it was they should all have been mute.

At the entrance to the Canal we were met by an Egyptian Vulture (*Neophron percnopterus*), who escorted and saw us safely into the Bitter Lake, although he did not perch on board. After he left, a Willow Wren (*Phylloscopus trochilus*) flew on board. A most restless little bird it was, flying all over the ship and creeping about the ropes, where, finding nothing in the way of insect life or refreshment, it left us at Ismailia.

We did not receive another visitor till three days out from Port Said, on 23rd September, when a Wheatear (*Saxicola œnanthe*) came to tea and slept the night. Next morning another had arrived, and a little later a Redstart (*Ruticilla phœnicurus*) put in an appearance. The Wheatears left in the afternoon for the south-east, and the Redstart made itself quite at home on one of the guns. It so happened that a sailor was turning out his "bag" (which is a nautical receptacle for clothes), and the ship during her twelve years in Australia had collected a very fine breed of Cockroaches. As the sailor was shaking out a jumper a Cockroach was jerked out on to the deck in front of the Redstart, who pounced down and greedily devoured it. That started half the crew Cockroach-catching, in which I joined myself, and there never was a pampered bird so banqueted before. I gave it eleven, and it was fed till dark; the capacity of its stomach was truly remarkable.

During the night our ship's terrier caught a small bird, which I believe was a Whitethroat from an examination of the chewed remains in the morning.

On sighting Malta, our friendly Redstart left us and flew away, not towards the land, but in a southerly direction towards the African coast; so I imagine the Redstart did not perch on board us for the sole purpose of resting, but had lost its way, and on its seeing Malta it recognised a landmark in the route southwards, and proceeded on its migratory course. The weather was fine all the way from Suez.

I never sighted another land bird till we were forty miles off the Land's End, when, in a strong north-easterly gale on Oct. 15th, a Song Thrush (*Turdus musicus*) flew on board. I never saw a more slovenly untidy bird, but as it was the first to welcome me home after an absence of five years from England, I forgave it its slatternly appearance. It didn't stay long, and, after trying vainly to fly to windward, turned tail, and was blown away on a course which would have eventually landed it in South America. Earlier in the morning I had seen a Duck (sp. inc.) very high up and flying very fast towards Ushant; but I can hardly include this in the list, as I failed to recognise the species. That completes my list of birds, and H.M.S. 'Royalist' arrived next day at Falmouth.

On reviewing the three lists I find the Turtle Dove (*T. communis*) appears in all three, and as I have observed it on a previous occasion, it seems to be quite a common visitor, and one feels inclined to wonder if it is gifted with insufficient powers of flight to cope with the great strain put on the species at this period of the year.

The same remark certainly cannot apply to the *Hirundinidæ*, yet they appear on my list and Dr. Hurlestone Jones's, and I can remember in 1893 catching three Swallows (*H. rustica*) in April when serving as a middy in H.M.S. 'Calypso.' Unfortunately I did not keep a note-book in those days, but we were somewhere between the Land's End and the south of the Irish coast. By the way, the Wheatear appears on all three of our lists.

Why do birds settle on ships—that is the question? One reason undoubtedly is the attraction of lights at night, especially the powerful white light which all steam vessels carry. For example:—One night, when off the Australian coast, a Red-tailed Tropic bird (*Phaëthon rubricauda*, Bodd) flew up against the mast this light was on, and, having stunned itself, fell on to the deck, where I picked it up, and skinned it. Its two long tail feathers were fortunately undamaged.

During autumn a vessel steering north in the Red Sea, where most of the birds on my list were observed, would meet, and attract, birds flying in a southerly direction. Several birds I have mentioned arrived and perched during the night.

But what about the daytime? In some cases, notably that of the Turtle-Doves, land was in sight all day, yet they did not leave us. The Red Sea is no great distance across at its widest part, and is well provided with littoral islands, offering many resting-places where the birds would be free from molestation. The only really weary wayfarer was the Quail, which appeared completely fatigued, and only rose at the last moment to avert capture.

In the Suez Canal, for example, the Willow Wren must have visited us out of pure curiosity, as it left a green and favourable-looking locality to perch on board.

The silence of birds on board I have already touched on, also the question of hunger.

As some of your readers are afloat, I appeal to them to make use of the ample opportunities that occur, principally in spring and autumn, for studying land birds that come on board. Some annotated observations on them *re* the two above-mentioned points would, I am sure, be of interest.

The majority of vessels in the navy now having merely pole masts and nothing in the way of rigging, but plenty in the way of funnels and ventilators, fail to offer the perching attractions that a masted vessel does.

When one starts discussing birds, the subject is so interesting that it can be spun out to an indefinite length, and the points in their economy that are after all only slightly known are many. I only hope that in writing these few notes and observations I have not wearied the patience of the reader.

HOW DOES THE CUCKOO CARRY HER EGG?

By A. H. Meiklejohn.

On May 12th, while on the road between the villages of Hamstreet and Woodchurch, in Kent, I had, to me, the unique experience of seeing a Cuckoo in the very act of placing its egg in the nest of a Robin. The facts are briefly as follows:—I happened to be sitting down by the roadside watching a Wryneck through my glasses, when a Cuckoo flew over my head, and, turning sharply, alighted on a fence-rail about two hundred yards down the road. From there she flew across and entered the opposite hedge, which was raised on a bank covered with a thick undergrowth of nettles, grass, &c. The Cuckoo had scarcely disappeared before she again re-appeared with a small bird in close pursuit, in which two or three Starlings, which evidently had young in the farm-steading opposite, joined. At this moment a man passing in a cart disturbed the Cuckoo, which, flying over the hedge, alighted in the meadow beyond. Noticing the bird's apparent disinclination to leave the place, I walked down the road and lay quietly on the grass opposite to, and at a distance of twelve yards (paced) from, the spot where the Cuckoo first entered the hedge. I had not sat there for more than two minutes when back came the Cuckoo, gliding along the hedge, and finally alighting with a loud squawk exactly opposite me. What struck me at once from this and many subsequent views of the bird was the swollen appearance of her throat, which half-way down showed a distinct protuberance, as might well have been caused by an egg. I several times turned my glasses on her, and at that short range I could plainly see the feathers sticking out over the distended part of her gullet; and, as my subsequent remarks will show, it seems to me that this swelling was caused by her egg. From the moment of alighting to the close of this domestic tragedy, the Cuckoo was attacked with the utmost fury by the pair of Robins, upon whose nest she desired to "board" her offspring. Again and again the little birds struck and buffeted her; and, on two occasions, one of the Robins seized hold of the Cuckoo by the back of the neck and hung on for a few seconds with all the fierce tenacity of a bull-dog. Whenever the Robins made one of their ferocious dives, the Cuckoo threw back her head, opened her great orange-coloured gape, and squawked loudly—ergo, *her egg was not carried in her bill.* Twice the Cuckoo disappeared into a recess at the root of a hawthorn, and this the Robins in no way resented. Emerging the second time from this recess, the Cuckoo, in spite of the fiercest opposition, alighted with out-spread wings and in a sprawling attitude about three yards further up the hedge. Here, pausing for an instant, during which the Robins got terribly excited, the Cuckoo made a sudden dash amongst the grass and disappeared entirely, *except for the end of her tail, which was sticking out and in full view all the time.* In two or three seconds she reappeared, and flew straight away out of sight, and so quickly that I was unable to see whether the protuberance in her throat had subsided or not. At once springing up, I ran across the road to the very spot where she had gone in. I put in my hand and felt three eggs, one of which was *moist and slightly sticky,*—and this egg proved to be that of the Cuckoo. I then went down and examined the recess which she had previously twice entered, and found to my astonishment a Robin's nest from which, by its appearance, the young had but lately flown—and in the hedge I saw a young Robin hopping about. What was the Cuckoo's reason for going to the old nest first? That this nest was in the same place as that which she had remembered as the last year's nursery for her egg seems to be one explanation.

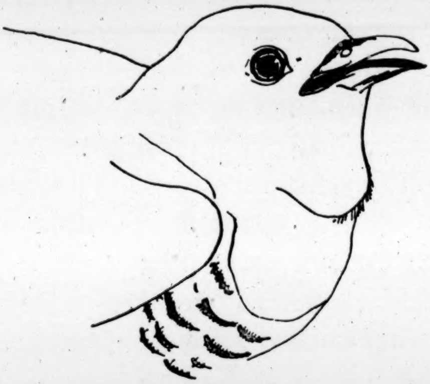
In support of my conviction that this Cuckoo carried her egg in her throat, may I be allowed to re-state the following facts?:—

I. She constantly opened her mouth to utter her continuous squawks of protest,—her egg, therefore, was not carried in her bill.

II. Her tail being visible to me all the time she was engaged at the nest, she did not *lay* her egg in the usual way.

III. The egg was moist and slightly sticky.

IV. The distended appearance of a certain region of her throat, as shown in the rough sketch below, might well have been caused by the egg.



NOTES UPON THE ZOOLOGICAL MEETING OF PAVIA.

By Count Ettore Arrigoni degli Oddi.

Two months ago a Committee, composed of the most illustrious Italian zoologists, invited their colleagues to a meeting which was to be held at Pavia on the 22nd and 23rd of April, 1900. The purpose of this meeting was to found a "National Zoological Union," and to facilitate and make possible an Annual Congress of Naturalists, which could only be done by long preparation. Amongst the subscribers may be mentioned the following University Professors:—Camerano (Turin), Cattaneo and Parona (Genoa), Emery (Bologna), Pavesi and Maggi (Pavia), Giglioli (Florence), Monticelli (Naples), and some others.

Many Italian zoologists approved of so useful and opportune an intention, and at the opening of the meeting in the Municipal Hall of Pavia several were present.

The President in the chair was Prof. P. Pavesi, a man dear to science and his friends, who is at the same time an illustrious naturalist, an appreciated politician, and now Mayor of Pavia. He warmly welcomed all those present, and stated he was pleased that the beginning of this Union should take place at Pavia. After the *vino d'onore*, Prof. Emery, of Bologna, thanked Pavesi for his kind welcome, and added some other opportune phrases. The first meeting took place at one o'clock in the Anatomical Hall, in order to decide if it would be useful to have a "Zoological Union" in Italy, and in this case to establish a scheme of statutes, and to name a temporary Committee. This meeting was presided over by Prof. Pavesi, having as a Secretary Miss Rina Monti, a young and clever naturalist. About forty persons were present, and amongst them I am pleased to mention Emery, Parona, Cattaneo, Maria Sacchi, Andres, Maggi, Martorelli, Monticelli, Coggi, Giacomini, Damiani, Ghigi, Picaglia, Magretti, Rosa, &c.

After interesting discussions the following statutes were provisionally approved :—

That an Association be established in Italy in order to diffuse and to advance zoology, and also to facilitate *rapports* amongst the lovers of this science, as understood in its fullest meaning, and to defend the interests of the teachers. That it take the name of the "Italian Zoological Union." That the number of its members be unlimited. That the "Union" shall have no fixed place of residence; that every year an ordinary meeting will take place in any Italian town fixed upon by the members, but that eventually arrangements may be made for extraordinary meetings. That its Council be composed of a President, two vice-Presidents, a Secretary (to be also a Treasurer), and a vice-Secretary; the duration of office to be for three years, and no re-election be allowed except in the case of the Secretaries. That the "Union" publish a simple bulletin with the names of its members—the "social bill"—the verbal proceedings of the meetings of the Committee and of the general meetings, and a short summary of the scientific work. The other matters which were established refer to the ordinary rules of the statutes, and are not generally interesting.

Ultimately the temporary President, Pavesi, delicately resigned, in order to leave the assembly free to elect whom it would; but he was asked to stand for the presidential chair, and was unanimously elected. The Secretary was Miss Rina Monti. The entire Committee will be chosen at the first annual general meeting.

The next day another meeting took place, when it was decided that the first assembly should be at Bologna, at the end of next September, and Prof. Ghigi of that town returned thanks for this choice, saying that Bologna would be proud of the decision. After a long discussion, on the proposal to have a zoological journal in Italy, and regarding the means to support it, a Commission was nominated, composed of the well-known Professors Emery, Cattaneo, and Monticelli, who will examine the question, and give the result at the next general meeting. At the conclusion the late proposed law of Minister Baccelli was fully discussed with regard to the teaching of natural history in secondary schools, and a motion was carried that the actual hours for study of natural history teaching, and particularly of zoology, be maintained as they are; that the same teaching be given only and exclusively by the Doctors in Natural Science, and it was decided that this be communicated to all the Natural History Societies of Italy, and afterwards communicated to the Ministry.

This concluded the meeting. On the same day a tablet was unveiled to the memory of that celebrated naturalist, Spallanzani, with a very masterly speech, delivered by Prof. Pavesi. A dinner afterwards took place.

To illustrate the real importance of a Zoological Union in any country is unnecessary. It certainly does not need any words, and every Italian naturalist will be grateful to Prof. Pavesi and his friends for this step. Before finishing these few notes I would express the wish that the newly founded Italian Zoological Society (Rome) will join itself to this Italian Zoological Union, and so make together a force and unite all the Italian zoologists in the best friendship for the advancement of our cherished science.

BIRDS ON THE RIGI.

By Rev. Charles W. Benson, LL.D.

In July, 1899, I was Chaplain under the Colonial and Continental Society at Rigi Kaltbad, and had an opportunity of observing the birds at different heights on the Rigi, not usually enjoyed by those making a very short stay in this truly delightful locality.

Although I was unsparing in my endeavours to note any birds from Rigi Kaltbad (4791 ft.) to Rigi Kulm (5900 ft.), I could only make a list of about twenty-six species, as follows:—

Kestrel Falcon.—Not common.

Carrion-Crow.—Very numerous.

Nutcracker.—Nesting near the path to Küssnacht.

Mistle-Thrush.—Fairly numerous.

Song-Thrush and **Blackbird.** — To be heard singing below Rigi Kaltbad.

Ring-Ouzel.—Very numerous, and taking the place of the Blackbird with us. Called "Berg Drossel" by the Swiss.

Black Redstart.—Very numerous everywhere on the Rigi.

Common Redstart.—To be found in more sheltered places.

Wren.—Very numerous.

Goldcrest.—Not so plentiful.

Blackcap Warbler.—Near Rigi Stäffel at height of over 5000 ft.

Chiffchaff. — Breeding near Rigi Kaltbad Hotel. These were the only Warblers on the mountain.

Robin.—In the woods; not very common.

Chaffinch.—Rather numerous.

Bullfinch.—Fairly plentiful.

Lesser Redpoll.—Tolerably numerous.

Coal Tit (*Parus ater*).—Numerous.

Siskin.—*The* bird of the Rigi. Very numerous everywhere, in small flocks, flying and singing. Some cocks in beautiful plumage.

Spotted Flycatcher.—Fairly common.

Green Woodpecker.—To be heard every day.

Tree Pipit.—Fairly numerous.

Meadow-Pipit.—Common.

Water-Pipit.— I saw but one, near the Rigi Stäffel Hotel. I was attracted by its greyish back and the whitish stripe over the eye.

White Wagtail.—Not common.

Swift (*Cypselus apus*).—I saw but one, and we were visited with no "Alpensegler," as the Alpine Swift is usually called.

In addition to these twenty-six species, I heard two different species of Woodpecker, which I could not see or identify, but think that neither was *Picus martius*, a bird I saw a few years ago at Bex, in the Rhone Valley.

As I always make it a rule to go up a hill on my birthday, I went up Pilatus on July 12th, 1899, and there, at a height of about 7000 ft., I saw the Alpine Chough, the Snowfinch, and the Rock-Thrush. I heard for the first time the pleasing little song of the Snowfinch, and the really delightful song of the Rock-Thrush; but this latter I had heard before at the Hospice of St. Bernard in 1896. To my mind the expression "bursts" or "snatches" of song best describes this delightful warbling, which alone enlivens those dreary and almost inaccessible places. There is just one little patch of green near the Hôtel Pilatus Kulm, and an observer standing above it, and looking over the wall, may see these rare birds below him, and hear undisturbed their delightful song, with something of the Robin in it, and of the Blackcap too.

I may mention that at the famous "Tunnels" on the Axenstrasse, near Brunnen, the Crag Martin may always be found, and also at the Gorges du Trient, near Vernayaz, at the Rhone Valley. I have also seen the Wall-Creeper near the Tunnels, but never yet have I been favoured with a sight of the Alpine Accentor, one of the very few Swiss birds whose acquaintance I cannot claim.

AN OBSERVATIONAL DIARY OF THE HABITS OF THE GREAT PLOVER (*ŒDICNEMUS CREPITANS*) DURING SEPTEMBER AND OCTOBER.

BY EDMUND SELOUS.

(Continued from p. 185.)

September 19*th*.—Arrived between 11.30 a.m. and 12 o'clock. The place seemed deserted. I could discover no birds after searching it well with the glasses. On rising to go, however, after remaining about half an hour, I put up one bird quite near on the edge of the bracken, and, later, three or four others from right amongst the bracken where it was a little thin and open. At about 4 p.m. a flight of some thirty or forty Great Plovers flew down on the scant (I think, burnt) heather bounding one portion of the amphitheatre, there having been none there before. Soon after I left.

September 20*th*.—Rose early, and, after some hours spent elsewhere, walked across the moor to the road that runs through it. Some little time after reaching it—it being now perhaps seven or between seven and eight—a large flock of Great Plovers flew over the moorland, and came down amongst the heather. They were followed by other flocks, all flying in a long, thin, irregular line. This made them less difficult to count, and I counted upwards of seventy in the largest flock. There must have been, *I should say*, near two hundred in all. A broad bank of earth runs near here, through both heather and bracken, clothed either with the one or the other, and behind the heathery part of this, and near to where a broad gap divides the two, the birds went down. Crawling up to this bank, and looking over it, I had a near and plain view of them. They were just standing and sitting about in the heather, and did not appear occupied with anything in particular. Whilst watching them another small party flew up, and, my attention being drawn by a note which I had not heard before, I observed that one of these latter birds was pursued by a Hawk—I think, a Sparrow-Hawk. The two were close together—in fact, almost touching—the Hawk just above the Plover, spread like a fan over him, following every deviation of his flight, upwards, downwards, to one or another side, but sometimes falling just a little behind, though there was never a space between them. The two, so to speak, always overlapped. The Hawk, however, did not strike, nor, apparently, attempt to, and neither the pursued Plover nor any of the others appeared to me much concerned.* I can hardly say why—perhaps it was the easy, parachute-like flight of the Hawk, with nothing like a swoop or pounce, and the bright clear sunshine diffusing an air of joy over everything—but somehow the whole thing did not impress me as being in earnest, but rather a sport or play. After a little while the Hawk left the Plover, and flew off to some distance over the moor, and alighted upon it. The cry made by the bird pursued (I assume it was made by that one) was so different from the note I had yet heard that I at first thought it was the Hawk, which I imagined to be mobbed by the Plovers, and in distress. I was soon satisfied that this last was not the case, and doubt on the other point was soon removed, for, the whole flock of birds shortly rising and flying off, I now heard the same note uttered by them all about. It is very different to any other one that I have yet heard. Though plaintive, it is not nearly so wailing, and more musical. It is a whistling note, with a sort of tremulous rise and fall in it ("tir-whi-whi-whi-whi-whi") very pleasant to hear, and bringing the sea and beach to one's mind. The whole troop shortly returned, and came down once more in the heather, in a little while again rose, circled about, flew off, returning again—and did this several times, giving me the idea that they are congregating previous to migration, and have the restless feelings preceding it. When the birds settled they would proceed a little through the heather, making their quick short runs with abrupt stops, and following each other, but the greater number of them would before long settle down and sit about amongst the tufts. They never ran over the tufts, but in and out amongst them as we would do. I observed no dancing, though altogether I must have had the birds under observation, I should say, at least a couple of hours. Neither did I observe them to be catching insects, or otherwise procuring food. Also I note that, except for this new note ("tir-whi-whi-whi-whi-whi"), and for far the greater part of the time, the birds flew silently. The whole flight up was in silence until the Hawk incident. No cry uttered whilst on the ground.

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* But I may have been deceived. See pp. 275–6.

At about 5.30 to 6 p.m. I returned to this same bank, distant by about some thousand yards from the place where I had first seen the birds assembled, and watched them dancing. When they had flown off in the evening, they had always gone in one direction (towards where I now was), and I wished to see if they would again settle on the heather here, or fly on, as I supposed they would. Not expecting to find any birds here now, I walked up without precaution, and put a good many up from the same place as this morning. It was a pity, as I should have liked to have noted their behaviour also as the evening came on. I now sat down behind the bank, looking over it in the direction of the amphitheatre. About 7 p.m. (as I suppose), the moon being well risen and bright (full or almost full), the birds began to fly up and over me, heralded by their wailing cry. I counted some twenty odd, but most escaped me in the gloom (the moon not helping much). They showed no inclination to stop at this second place of resort (as I now think it to be), but went right away over the country, flying in twos, threes, or fours at irregular intervals. Compare this with their morning flight in a great flock, silent, or, if not, uttering a quite different note.*

September 21*st.*—Walking to the same place as yesterday, I concealed myself on one side of the bracken-covered part of the bank near the wide gap, and commanding the moor in two directions. This must have been about 5.35 or 40 a.m.

Bright and clear, but breezy and chilly. Rabbits about, but not very alert, and as I walked along the road I noticed several that sat as if asleep by their burrows.

Lightening now in the east, but sun not yet visible from behind a wooded hill.

A small flock of Starlings (first bird-life noted) fly by over the moor.

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* But *this* morning flight was with little doubt due to the birds having been disturbed, as will shortly appear.

Few minutes afterwards cooing of Wood-Pigeons heard in distance (more or less) from wooded parts around.

Sun now risen over crest of hill.

Some small birds fly over the moor in same direction as Starlings (towards some wooded pieces).

A Stonechat hovers in the air quite near me (I think, examining me), the body seeming always to be in the same place, and almost motionless, the wings continually and strongly waving.

Some ten or fifteen minutes later (sun now shining through tops of row of tall fir-trees skirting road not far off) a couple of Wood-Pigeons fly over the moor, and the cooing becomes more *en évidence.* Then, as the sun crests the fir-trees, a Thrush (flying very high for a Thrush) flies over moor. Then seven Wood-Pigeons high in air. Small birds now fly over in numerous little parties, two often chasing each other in joy and sport, as though it were the pairing season. Their twittering is heard about, the earth becomes lightened by the rising sun (now well over firs), and life really awakes.

But no sign of the Great Plovers yet.

Sun well up (twice height of fir-trees), yet no sign of them.

Must now be getting on for seven.

Hawk sailing in air some way off, annoyed by quite a cloud of small birds. This continues for some time. They do not appear to be Swallows, but Buntings (to give a guess), and other small Passeres. Hawk makes no endeavour to catch one.

Splendid day as yet, but sharp and cold.

In about another quarter of an hour a small flight of Wild Duck fly high in air, following course of stream (up stream).

I now notice some Plovers amongst the heather on other side of bank in same place as before. They have, I think, been there all the time, but I had taken them for Rabbits, and not used the glasses. I cannot make out a dozen. They are quite quiescent, all sitting, some preening themselves a little. Searching the heather thoroughly can make out a few more, equally inactive.

Whilst thus engaged the main body of the birds came by in a great flock, flying right over me, many of them, I should think, not more than eight to twelve feet above me as I crouched on the ground (perhaps lower). I had just got back to the other side of the bank, and raised my head, as it were, into a cloud of birds. It was a charming and indescribable sensation, to be thus suddenly surrounded by these free fluttering creatures. They were all about me, and so near. The delicate "whish, whish" of their wings was in my ears, and in my spirit too. I seemed in flight myself, and felt how free and how glorious bird-life must be. They had taken me quite by surprise, coming up quite silently from the direction of the amphitheatre—upwards of one hundred at the very least, I should say; but so effectually does the heather conceal them that, now they are down with the rest, I can only count thirty through the glasses. After running a little in their characteristic way, as described, they for the most part stand and sit about in the sunny heather. I can now, though none have gone up since, only count eleven in the heather.

Another flock—this time a small one—now flies over me, and joins the rest. I am again taken by surprise, as I am lying on my face, examining the other birds, with my back (or rather my heels) turned towards where these come from. Can only tell that they fly from the same general direction as the first flight, and they also pass exactly over me at a similar height.

The birds, having now thoroughly settled down, I search the heather well with the glasses over a wide space, and out of all that great number can only make out twenty-six. The glasses discover a good many open pools and little canals of grass amongst the heather, but in none of these is a bird to be seen. They must therefore be right amongst the heather. Many of those I count are heads just protruding from it. Others are standing or sitting against the side of the tufts where it is rather thinner. A small naked patch or two may therefore be said to be occupied in this way, but where it gets more open there are no birds. I should think, indeed, that the birds generally sit close against the sides of the heather-clumps, and not right in the middle of them. Those that I can see seem to be so situated.

It must now be past eight, perhaps past nine, but there has been no flying backwards and forwards from one place to another, or circling about, as on yesterday. The birds have all remained where they went down, nor have any of those that were there when I came flown away. They are, indeed, wonderfully quiet this morning (compared, at least, with yesterday), hardly a bird running (none just now), but all sitting and sunning themselves; for one rising and running, or rising merely, becomes at once visible. It is a fine sunny day, but was fine and sunny in the morning yesterday too. It is, however, I think, somewhat less cold.

September 22nd.—Between 3 and 4 a.m. a violent storm was blowing, with, as I thought, rain, and I was anxious to see how this weather might affect the birds. At daylight, though not quite so rough, it was still blowing almost a gale. No rain was falling, nor do I think any had fallen. A west wind; the western part of the sky clear. I first went to my old watch-place on edge of amphitheatre, expecting to find the birds assembled there, as they had flown up yesterday from that direction; but, on searching with the glasses, I could not discover any. (It was quite light, probably between 5.30 and 6, but had forgotten to look at clock before starting.) I then walked to same place as yesterday, and, sitting with my face turned towards where I had come from, waited for the birds, hoping to be able both to watch their flight up and mark their point of departure. I first noted, however, that some birds (possibly a good number, though I could only make out six or seven) were sitting in the heather on other side of bank, in same place as before. This long bank, for the most part covered with bracken, dividing the moor, and approaching in one place near a patch of open wood, gives fine opportunities for patient watching. I watched, however, in vain—no birds appeared; and, when I judged it to be about nine or later, I thought it no use to stay longer. It may perhaps be on account of the very strong stormy wind inclining them to lie close, for I do not suppose they had flown up before I came, so much earlier than on the two preceding mornings.

As I am on the point of going five birds fly up, but on reaching bank they shear off, and fly right away instead of going down amongst the others; may possibly have seen me. They did not come from direction of the amphitheatre as on former occasions.

In reflecting on the incident of the Hawk and Plover, as witnessed by me on morning of 20th, I begin to think I may have misinterpreted it—undervalued it, so to speak. At the time it did not seem to me either that the Hawk was much in earnest or the Plover much alarmed; nor could I observe that the birds generally seemed particularly scared or excited. Reflecting now, however, that my attention was first called to it by a peculiar cry on the part of the Plover, which I had not heard before, and that the frequent utterance of this cry by the birds generally, their restlessness, frequent risings, circlings about, and flights backwards and forwards from one place to another, all took place subsequent to the chase; and then, contrasting this conduct with their behaviour next morning (not rising again after they had once gone down), I am inclined to think that the one may be explained by their alarm at the Hawk, and the other represent their usual habits.

September 23rd.—Must have got to the bank (same place as yesterday) about six. Sun just rising. Fine day. A fair amount of wind, but nothing compared to yesterday. Calm and still in comparison. Some birds in heather as before. Cannot tell how many, or whether any have flown up. After sitting and waiting a long time my attention was attracted by some cries of Herons in neighbouring copse, and I crept up the bank and listened, with the intention, if the Plovers should not come soon, of walking over and trying to get close enough for observation. At this moment, and whilst looking in opposite direction, a small flock of Plovers flew over me, and came down amongst those already in the heather. There were seventeen, and they flew quite silently. Vexed to have missed them again, I re-descended the bank, and had not been settled in position many minutes when a large number (evidently the main body) rose in a cloud into the air (as it seemed to me directly over the amphitheatre), and after circling a little, shining in the sun (their light under surface looking a beautiful soft silver), came straight down in my direction. I concealed myself well amongst the bracken. They passed as before, but, as I had a little shifted my position, not so directly over me. They flew silently—I did not hear a single cry—and as soon as the last had passed me I crawled again to the edge of the bank, and was in time to see most of them come down in the heather amongst the others—a very pleasing sight. They alight with wings raised above the back, and little stilt-legs stretched down, slanting a little forward, and on touching the ground give (in most cases, I am not sure if in all) a little run forward. After the descent there was a good deal of running about, and very shortly another smaller flock flew up, doubtless from same place, though this I did not see. This last may have contained some twenty to thirty birds. The main body it was impossible to count; they were more together than before, not in the long straggling line that I had noted on 20th. After they had gone down I made haste to count them before they had become more concealed by the heather, and I made out one hundred and eight, some five or ten minutes later about seventy, and again, counting them after making these entries (commencing from about the Herons, and taking, I should say, a quarter of an hour), I could still make out fifty-four. They do not therefore appear to have concealed themselves quite so effectually as on 21st. There were no birds running about. As far as I can judge without a watch, it must have been about 8 a.m. when the birds flew up. After the last batch of them had arrived I again heard, once, the whistling note I have described ("tir-whi-whi-whi-whi-whi "), otherwise there was complete silence.

(To be continued.)

NOTES AND QUERIES.

AVES.

Occurrence of the Water-Pipit (Anthus spipoletta) in Sussex.—On Feb. 27th last I received for identification a Pipit from Mr. G. Bristow, of St. Leonards. The letter accompanying the specimen stated that it had been shot on Feb. 19th at Hollington, near St. Leonards, by a boy named Peacham. On comparing the bird with the descriptions in Dresser's 'Birds of Europe,' I came to the conclusion that it must be a specimen of *Anthus spipoletta*. This identification was afterwards verified by Mr. Howard Saunders. The bird was a hen by dissection.—N. F. Ticehurst (Winstowe, St. Leonards-on-Sea).

Flycatcher feeding on Worms.—On May 12th I noticed a Flycatcher (*Muscicapa atricapilla*), which had only arrived that morning, feeding on worms. The day was cold and wet, and probably flies were scarce, and the bird weary. Is this unusual? I do not remember a similar case coming under my observation.—R. H. Ramsbotham (Meole Brace, Shrewsbury).

Great Spotted Woodpecker (Dendrocopus major).—On Tuesday, May 15th last, about 7 p.m., I was in my garden on Greenhill, Evesham, and, hearing the peculiar rattling noise attributed to these birds in common with the smaller Spotted Woodpecker, I followed the sound which proceeded from the plantation adjoining the garden. I found it very difficult to determine the exact spot the noise came from; for one moment it appeared close at hand, and the next some considerable distance away. In the plantation there are a quantity of dead or dying beech trees, and, thinking it probable the noise proceeded from one of them about fifteen yards or more beyond me, I stood behind the trunk of a tree and waited. Fancying I saw a slight movement in a Scotch fir tree nearer to me than this beech tree, I watched carefully, and soon discovered a Woodpecker perching close against the trunk of the fir, its breast only being visible to me, its head and beak then being hidden by the trunk of the tree. All at once the bird began hammering with its beak at a dead branch which joined the tree-trunk where it sat, and the strange ringing rattle was produced. With the aid of a powerful glass I was able to observe the action of the bird carefully, and found myself scarcely able to believe that such a sound could be thus made. The branch was sharply hit or pecked by the bird with the point of the beak, and its head was moved with extraordinary speed so that the action appeared almost continuous. I estimate the continuation of each period of hammering at five or perhaps ten seconds, which was followed by a somewhat longer pause. The bird was of very brilliant plumage—evidently the male bird—and the noise had been repeated four or five times when it was joined by a second bird, evidently its mate. The pair then moved to another part of the tree, and to the leafy branches of a beech tree standing between me and the fir, and it was only at times that I could distinguish them before they flew away. My presence was quite unsuspected by them, and I am convinced that the rattling was the call-note of the male bird, as it is said to be. Upon the meeting of the birds the noise was at once discontinued, and the only sound the birds made were soft twittering noises, as if speaking to one another. The branch used as a sounding-board was of considerable size, and at a height of about fifteen or twenty feet from the ground. The bird whilst hammering was almost sitting at the union of the tree and the branch in an upright position, and its beak was moved nearly horizontally, being very slightly inclined downwards. With the aid of the glass I clearly saw marks of the beak upon the bough.—OLIVER H. NEW.

Breeding of the Shoveler (Spatula clypeata) in Kent.—On May 3rd last I put up a pair of Shovelers from a piece of water in Romney Marsh; I got a good view of them through my glasses, and saw them a second time about half an hour later, when they flew back over my head. I searched the neighbouring rush, tufts, &c., but was unable to find any nest. On going back, however, to the same place on May 19th, I saw the hen bird swimming, followed by nine young ones a day or two old. The cock bird was not visible on this occasion. So far as I am aware, this is the first record of the Shoveler breeding in Kent. — N. F. TICEHURST (Winstowe, St. Leonards-on-Sea).

Breeding of the Garganey (Querquedula circia) in Kent.—I have the pleasure of recording, I believe for the first time, the breeding of the Garganey in Kent. My brother found the nest on May 2nd in Romney Marsh. It was situated in quite a dry place in some long grass, and between thirty and forty yards from the nearest water. When first seen the nest consisted of only a few strands of dead grass, and contained one egg. On May 3rd there were two eggs, and a lot more grass-strands had been added to the nest, which was so well covered up and hidden that we had some difficulty in finding it again. On May 7th the nest contained six eggs, which were sparsely covered with down and a few grass-stems, the nest itself, owing to its increasing size, being much more easily seen than before. Subsequently, on May 12th, we found a second nest containing five eggs and the remains of a sixth, which had been broken probably by being trodden upon by a sheep. The nest was deserted, the remaining eggs being glued to the nest by the contents of the sixth, the spaces between the eggs being occupied by a small growth of mildew. The amount of down in this nest was much less than that in the first, but still there was quite enough to surely identify the eggs by, the down being quite characteristic, and wholly unlike that of the Common Teal. I have suspected that this bird bred in Romney Marsh for some years, ever since having been told by a former resident there that a pair or two of Garganeys generally turned up at a certain spot about the 1st of May every year, but that so far as he knew they did not breed.—N. F. Ticehurst (Winstowe, St. Leonards-on-Sea).

Little Crake in Shropshire.—A specimen of this rare bird (*Porzana parva*) was shot in November, 1898, by Mr. Tatton at Petton Park, seven miles north of Shrewsbury. It was lately recognized by my friend Mr. W. H. Hodges. Subsequently Mr. Tatton lent me the specimen, and I exhibited it at a meeting of the Caradoc Club. Mr. Howard Saunders has also seen it, and confirmed the identification. The occurrence is especially interesting since no authentic records are known, I believe, for any of the western counties north of Somerset.—H. E. Forrest (Shrewsbury).

The Tameness of unmolested Birds.—In a letter received last month (May 10th) from my friend the Rev. A. F. Day, S.J., he gives me some graphic accounts of the confidence shown by wild birds to the inmates of St. Benno's College, St. Asaph, N.W., where theology is the passion rather than zoology, and where skins and eggs are presumably not collected. He writes:—"Nearly all the Robins come freely on to the hand to take the food that is offered them; several will pick it out most dexterously from between the lips. The general accomplishment of cock Chaffinches is to catch fragments thrown up into the air, and one or two (at least) come on to the hand almost as confidently as the Robins; but now that nature's provision is plentiful we more seldom succeed with them or the other occasional birds. The Hedge-Sparrows have lately taken to stepping on to one's hands if lowered towards the ground, and it is with considerable assurance for such modest little creatures. The Coal-Tits have never been shy, but it was considered something of a triumph to get the Blue Tit to follow their example; and now there is even one Ox-eye (Great Tit) that does likewise—him I had on my hand yesterday. Such are the main facts connected with the St. Benno's natural aviary (I mean grounds). A short time ago I had a Coal-Tit firmly perched on my fingers for what seemed at least a minute, whilst excavating half an almond held between my thumb and forefinger. If you don't believe above, come and verify it."—Ed.

Ornithological Notes from Shetland.—A specimen of Buffon's Skua (*Stercorarius parasiticus*) was obtained on May 24th, a male in full plumage, measuring from tip of beak to tip of central tail-feathers, 21¾ in.; the central tail-feathers were 11⅝ in. in length. The stomach contained a few small beetles and some vegetable matter like tops of heather. I am not aware that the bird has ever been recorded as visiting Shetland. The Blackbird (*Turdus merula*), usually described as merely a visitor to our isles, is now resident throughout the year, and has nested and brought out young for several years past. A pair built a nest in the honeysuckle which grows on the south wall of our house; four eggs were laid, but a marauding fiend of a cat upset all the domestic arrangements, and the birds have disappeared. I have been watching for some time past another nest built by a pair of Blackbirds in a loose stone wall close by the house, and to-day (May 26th) I was pleased to hear the chirping of young birds, and to see the old male carrying food to and fro. The season has been very bleak and cold; the leaves are only appearing on the trees now, and this, together with the desire to circumvent the odious cats, may have induced this particular pair of Blackbirds to abandon their usual habit of building in a shrub, and flee for security to a stone fortress. I am very much amused with a Starling which haunts this house; his power of imitating is excellent. I have heard him imitating perfectly the Blackbird, Hooded Crow, Corn Bunting, my police-whistle, and the neighing of a Horse.—T. EDMONDSTON SAXBY (Halligarth, Baltasound, Shetland, N.B.).

AVICULTURAL NOTES.

Hybrid Doves.—*Homer Pigeon* ♂ × *Collared Turtle* ♀.—While in Manchester the other day I called upon Mr. Fred Muirhead, of Barnfield, Prestwich, to see his interesting little collection of living animals and birds, and more especially to examine a hybrid betwixt a cock Homer Pigeon and a hen *Turtur risorius* that I had heard of. It is a male, and was bred in 1899. Its parents were not regularly paired, as it was the result of illicit intercourse, the male parent having already his own household located in the same aviary close beside the Turtle. In appearance the hybrid is of bolder carriage and smarter figure than a Turtle-Dove, while in colour it is all over of a much darker shade, wanting the dark collar, or any indication of it. The neck shows a beautiful vinous reflection similar to that of many dun or red-coloured Pigeons. Across the terminal third of the tail there is an indication of a dark bar. In size it is decidedly larger than the Turtle, slim and elegant in outline. The voice differs markedly from either the Pigeon or the Turtle, and appears to me, allowing of course for the lesser volume of sound, to be exceedingly similar to that of the Wood-Pigeon (*Columba palumbus*). The hybrid (only one bird of the *mésalliance* was reared) has been mated this season to a Turtle-Dove, but as yet the eggs have proved infertile. According to Count Salvadori ('Cat. of Birds,' xxi. p. 414), *T. risorius* is a domestic race of uncertain origin. It is not, however, probable that there is anything "composite" about its pedigree. Long domesticity would seem to have developed some tendency to hybridity when opportunity offers. Some instances are noted (*loc. cit.*) with the Passenger Pigeon (*Ectopistes migratorius*), and with the male Fantail Pigeon, a whole series of specimens being obtained in the latter instance. Mr. Blagg has recorded (Zool. 1891, p. 113) a cross with *T. communis*, and Mr. W. Williams has also described a similar case (Zool. 1894, p. 64).

Domestic Pigeon × Columba œnas.—Several years ago my friend Mr. James Blacklock, of Southwick, in my own neighbourhood, obtained eggs of the Stock-Dove from the ivy-covered sea-cliffs near his place, and had them hatched under Common Pigeons. The young Stock-Doves were reared successfully, and last year paired with Pigeons. Eggs were laid and successfully hatched, but all the hybrid young produced in successive broods have invariably died when a few days old. This present season the same thing has happened, and no hybrids have lived more than a week or so. I applied in the columns of a fanciers' paper to see if any Pigeon rearer could suggest a remedy, but so far none has been suggested to obviate this aggravating result.—Robert Service (Maxwelltown, Dumfries).

PISCES.

The Pike and its Prey.—The voracity and cannibalism of this "freshwater Shark" is so well known as to need no comment here, and the fact of my present note may be superfluous for the readers of 'The Zoologist'; but until recently I had an idea, from my own small experience in the matter, and information from various anglers, that the Pike invariably swallowed its finny prey head foremost; if so, I have an exception which proves the rule. At the end of January a friend of mine caught a female Pike weighing 18 lb., and, on opening it, a fish of the same species was found in the stomach, weighing originally, I should suppose, from eight to ten ounces; but the flesh of the tail portion of the body was partly digested, as it had been swallowed tail first, which I supposed was somewhat remarkable, as in my limited experience I had not met with a fish in a like position in stomach of either bird or fish, and I have dissected some numbers for the sake of ascertaining their usual food. I can well understand that a comparatively small fish once within the grip of such a tooth-arrayed and ponderous jawed monster had a very remote chance of escape, whether taken head or tail first; and I had been led to believe that if a fish was taken crosswise it was worked in the jaws of its captor until the head of the victim pointed throatward. Of course it is well known that the murderous pointed hooks are directed towards the head of the "bait," which seem to upset the theory of head first.—G. B. Corbin (Ringwood, Hants).

NOTICES OF NEW BOOKS.

The Birds of South Africa. Vol. I. By ARTHUR C. STARK, M.B. R. H. Porter.

THIS volume introduces the series about to be published on the 'Fauna of South Africa,' edited by Mr. W. L. Sclater, the Director of the South African Museum, Cape Town, and possesses a melancholy interest by the fate of its author, who was killed at Ladysmith during the late siege.

Ornithology is rapidly becoming—even if it is not already—much less an esoteric science, to be followed only by students of means, who found it possible to acquire a charming but all too expensive a literature. We already possessed Sharpe's edition of Layard, and the excellent 'Notes on the Birds of Damara Land,' by Anderson, revised by Mr. J. H. Gurney; but these were practically the only handbooks on the South African subject. There was a large literature, as may be seen by the bibliography given in this volume, but it pertained to the possession of a specialist's library; while the ponderous, expensive, and somewhat unreliable volumes of Le Vaillant were not only outside the reach of most, but represented an archaic form of the science. Consequently this book supplies a real want, as any traveller or collector in that now unsettled region will gratefully acknowledge.

The classification pursued is very largely an eclectic one, based upon the proposed systems of Messrs. Sclater and Sharpe; the plan and arrangement followed is that of Mr. Oates in the volumes on "Birds" in the 'Fauna of British India,' while a very welcome feature of the book is the quite unusual amount of information afforded under the heading "Habits." This subject should, and probably will, incite many observers to fresh efforts, for the bionomical story of the South African Birds is yet very largely to be told. Much has still also to be added to the distributional areas of the birds. Thus the so-called "Mountain

Canary" (*Alario alario*), stated to be confined to Cape Colony and Great Namaqua Land, is also a sometime visitant to the Transvaal, the writer of this notice having still a living specimen of this constant songster which was captured more than six years ago near Pretoria.

Much information is given as to the nidification of the species, which by the descriptions and descriptive "keys" can be readily identified, though the volume only deals with about one-half of the Passerine Birds. We shall await the appearance of future volumes with the greatest interest, and the series will probably do the same for the fauna of South Africa as those edited by Mr. Blanford have done for the zoology of British India.

Catalogue of the Arctiadæ (*Nolinæ, Lithosianæ*) *in the Collection of the British Museum.* By Sir George F. Hampson, Bart. Published by the Trustees of the British Museum.

With commendable energy and promptitude Sir George Hampson has completed the second volume of his "Lepidoptera Phalænæ," the previous volume having been noticed in these pages last year (1899, p. 37). The present instalment contains 589 pages, the critical arrangement and description of no fewer than 1217 species, and, in addition to over 400 uncoloured figures in the text, there is also issued in a supplementary form eighteen excellently coloured plates.

When we estimate the amount of thorough work expended in this publication, based on the examination of nearly all available material, with its specific and generic revision, its keys to facilitate identification, and its ample references to geographical distribution, combined with the universality of its fauna, there can be little doubt we are receiving the most important entomological publication of the day. Of course views will, and must, differ on generic division; on specific differentiation probably the last word is said in many cases, and naturalists, as a rule, as well as lepidopterists in particular, should welcome the healthy specific synthesis that obtains in these pages.

We are inclined to appraise these works beyond the purely entomological standpoint. A directory may give the names and addresses of a population, but does not constitute the history of a people. If this is true of humanity, how equally certain is the application of the principle to other animals than man. The great conclusions that have been drawn from zoological studies—especially during the last fifty years—have been based on a nomenclature which has frequently misled and generally hampered the student who sought to philosophise on the teachings of specialists. According to one authority, a genus may be peculiar to an island; to another such a genus is considered as a synonym of one which ranges over more than a single continent. Some have actually been unable to treat a species as cosmopolitan, and have seized minute local characters for specific division; others have failed to see differences where such exist. It is thus evident that the right conclusions on zoo-geography depend upon some finality in nomenclature. Such a monograph as the present—for it is more than a catalogue—is the type of publication which, while assisting the lepidopterist, will prove a boon to the much distracted naturalist.

Descriptive Guide to the Collection of Corals on view at the South London Art Gallery, Camberwell, S.E.

We have received this Descriptive Guide to the Collection of Corals on view at the South London Art Gallery, a collection lent for the purpose by Mr. John Morgan, of St. Leonards. We were quite surprised to find, instead of the usual type catalogue —as much at home with an exhibition of wax figures as a collection of zoological objects—a most readable pamphlet on life-histories of the polyps themselves. This small publication contains two good plates, some twenty-eight pages of printed matter, a reference to some "popular works on Corals," and is sold for one penny. With such a guide any person of average intelligence, though without a previous knowledge of the subject, can follow each specimen in the collection, and at the same time learn some of the mysteries of Coral existence. This is a very good move in a right direction.

EDITORIAL GLEANINGS.

NOTES on the mode of growth of *Tubicinella trachealis*, the Barnacle of the Southern Right Whale, have been contributed to the 'Transactions' of the South African Philosophical Society (vol. xi. p. 1), by Dr. R. Marloth. The question had been raised by what means these parasites were able to penetrate into the epidermis of the Whale, seeing that their base was quite unarmed, their mouth being turned outwards towards the water. Dr. Marloth suspected that the Barnacle possibly secreted some fluid which possessed the power of dissolving the epidermis, and tested this theory by chemical experiment, which he details. This proved that a peptonising ferment diffuses through the basal membrane of the animal, and this fact explains its peculiar structure, as well as that of the skin of the Whale at the infested parts of its head. The young *Tubicinella* simply dissolves the epidermis with which it is in contact, absorbing the peptonised liquid. As it continually grows at its lower end, it gradually descends in this way into the epidermis, the digesting of the epidermal layers taking place at the same rate as the downward growth.

IN the last published Trans. Nat. Hist. Soc. of Glasgow (vol. v. n. ser. pt. iii.), Mr. R. Hedger Wallace has concluded his communication on "White Cattle; an Inquiry into their Origin and History," the first part of which was referred to in our volume for 1899 (p. 41). The author in this instalment has dealt with the historical data relating to his subject, and has gathered considerable evidence pointing to the sacrificial customs connected with White Cattle, such as the erstwhile "Oblations of the White Bull" at Bury St. Edmunds, and the autumnal sacrifices of cattle in South-western Brittany, where at the present day the sacrifice takes the form of an auction, instead of the more ancient burning. Mr. Wallace concludes that this yearly custom in Brittany supports him in the views he has already expressed, "that a study of the folk-lore of this country, coupled with a study of the ceremonials, festivals, and traditions of the church, will afford us a satisfactory explanation why White Cattle have been carefully preserved, so that we yet find them preserved in parks." A most valuable and extensive bibliography relating to the subject is appended to this very thorough publication.

In the 'Contemporary Review' for May, Mr. Matthias Dunn contributes an article on "Mimicry and other Habits of Crabs." The instances adduced as mimicry seem to fall under the terms "Assimilative Colouration" or "Active Mimicry." Of "Habits" there is quite a number of most interesting observations recorded. Of *Cancer pagurus*, the Great Crab, Mr. Dunn has been led to believe that the finest specimens exist between Dartmouth in Devon and the Lizard headland in Cornwall, where males are often known to reach thirteen and fourteen pounds weight, and where they are only called half-Crabs when under eight inches across the back; whereas on most other parts of the British Isles Crabs two or three pounds weight and six or seven inches across the back are considered large. The powers of smell and eyesight in this species are fairly good, and it prefers fresh red-coloured fish as food, such as the Red Gurnard, Red Mullets, and Bream, or the strongly perfumed flesh of the Whitehound Shark. Its enemies are all the large Skates existing on the coasts, with the *Octopus vulgaris*, and the Nursehound Sharks; while the Sea-Breams and Wrasse delight in feeding on the remains of their slaughter. The Skates hunt them with great energy, and with their tough snouts rout them out of the crevices of the rocks, and, after crushing them, devour them whole. Mr. Dunn has seen as many as five of these Crabs in the stomach of one Skate. The Octopus also feeds on them ravenously, and, but for their sharp nippers, would scarcely look for any other food. He has more than once seen such Cuttles with their arms bitten clean off, which no doubt was the result of battling with these Crabs. The Nursehound also feeds on the smaller forms.

In the 'Cornhill Magazine' for May, Mr. C. Parkinson writes on "The Great Birds of the Southern Seas." The Albatross was well observed, and graphically described. On approaching Tristan da Cunha three or four species of Albatross had congregated round the ship, as many as thirty birds settling on the water astern in a manner highly satisfactory for close and continuous observation. After half a gale of wind a lull not infrequently occurs, when the speed is reduced to two or three knots; then the hungry creatures literally clamour for food. Directly a bird intends to alight, the legs appear straddling downwards in ungainly fashion—a moment when even an Albatross looks like an ill-balanced Goose of unwieldy size. For half a minute it runs along the surface of the waves, treading water, so to speak, until the enormous wings become manageable. Then the bird swims with both wings thrown back, like a pair of lateen sails—a very Argonaut on the translucent sea. At length the difficulty is overcome, the wings are packed away, and—like a large Gull—it rides the waves with consummate ease. Sometimes it paddles to and fro, or again it dives gracefully beneath the surface after Squids or similar ocean dainties. Half a dozen birds perhaps gravely assemble to inspect an empty beer-bottle thrown overboard to bob up and down idly upon the waves, and inquisitive bills peck vigorously at the unsatisfactory flotsam, until a battle-royal disperses the family party. The wiser ones meanwhile hover in mid-air, craning their necks to throw penetrating glances from a superior height.

Of the Wandering Albatross (*Diomedea exulans*), the writer found eleven feet six inches to be the average wing measurement, although a gigantic specimen in the Sydney Museum extends seventeen feet six inches, with a bill six inches long. At Randwick, near Sydney, he knew of one of the "Mollymauks" having lived for fifteen years in a garden. It is a universal pet, a sort of monarch of the domain, and quite unabashed even at the presence of strangers. It will answer to call, possesses an imperturbable temper, and is gentleness itself with children. Although the "thrice resounding waves" for ever reverberate on the shore close at hand, the bird, strangely enough, never evinces the slightest desire to return to a seafaring life. Yet on a ship the captive refuses all food, and simply pines away; the heat of the tropics is said to be always fatal.

SOME records of heavy weights of fishes have lately been published, and it is desirable that these should be preserved.

STURGEON (*Acipenser sturio*).—On May 30th, at the stores of Messrs. Spiers and Pond, Water Lane, London, a huge fish was exhibited, weighing 614 lb., measuring from tip of tail to extremity of snout a little over 11 ft., with a girth of 5 ft. 6 in. It was taken in the North Sea on May 28th. Another specimen from the North Sea was in the first week of May on view in the Pentonville Road. This fish weighed 525 lb., but its length was not ascertained. (R. B. L. in 'Field.')

SALMON (*Salmo salar*).—One caught in the Severn of 51½ lb., at the shop of Mr. Grove, Bond Street, on May 15th.

RED MULLET (*Mullus surmuletus*).—A large specimen caught off Land's End on May 18th. Weight, 3 lb. 3 oz.; length from nose to tail, 18 in.: girth, 12 in. (H. T. Welch, 'Field.')

CAPE SALMON (*Otolithus æquidens*).—A specimen caught at Algoa Bay by Dr. Bateman, weighing 65 lb., 61 in. in length, 32½ in. in girth. Preserved, and exhibited at a meeting of the British Sea Anglers' Society, May 30th.

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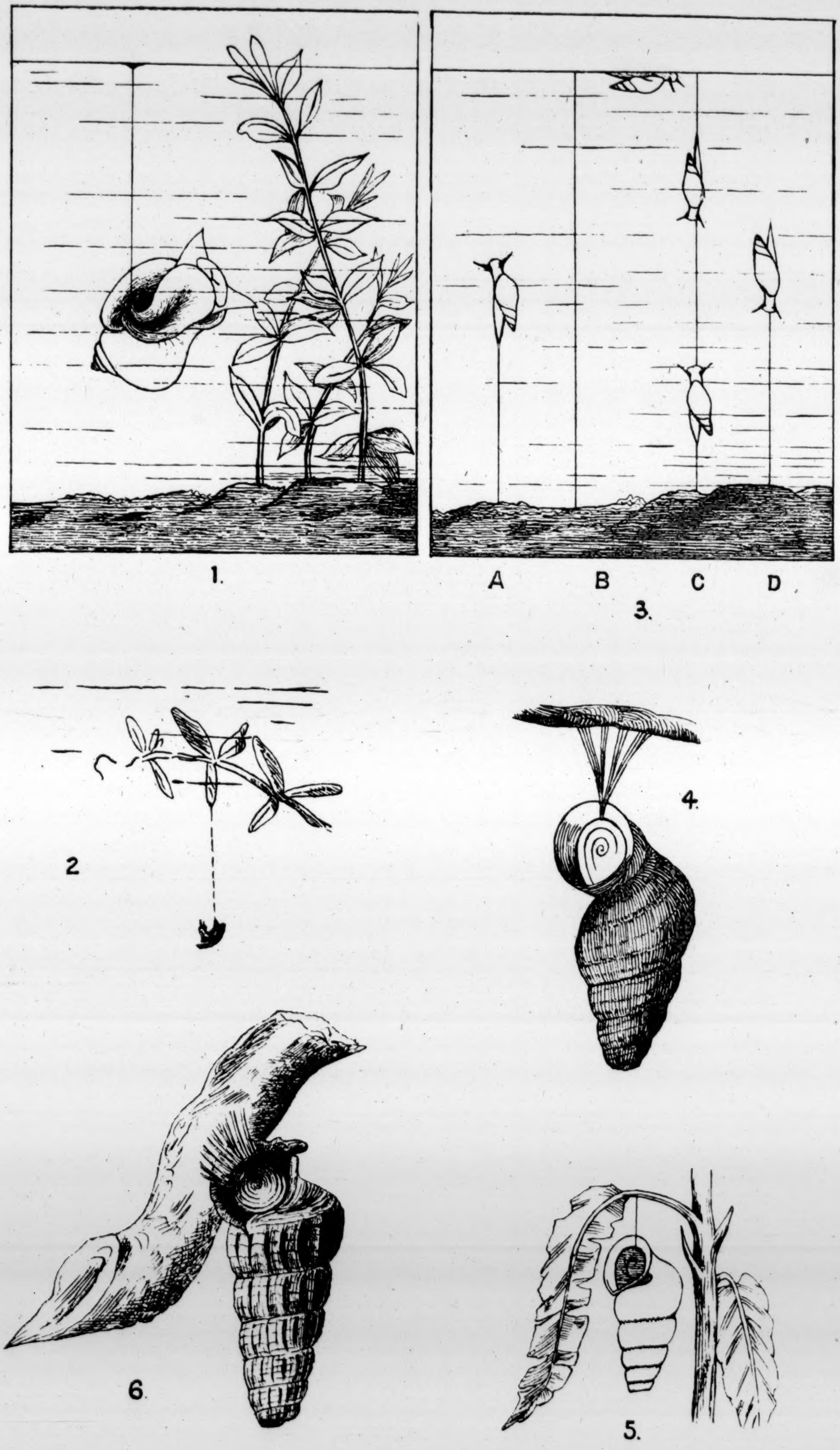

West, Newman, photo.

SPINNING MOLLUSCS.